

THAT WHICH IS CLAIMED

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1. An artificial implant comprising at least one component formed of a biocompatible metal alloy, said biocompatible metal alloy being essentially free of carbide, nitride, and sigma second phase particles and having a hardness greater than about 40 Rc, a yield strength greater than about 120, and a grain size finer than about ASTM 10.
 2. The artificial implant of Claim 1 wherein said biocompatible metal alloy is essentially free of all second phase particles.
 3. The artificial implant of Claim 1 wherein said biocompatible metal alloy is a cobalt-base alloy.
 4. The artificial implant of Claim 2 wherein said biocompatible metal alloy is a cobalt-base alloy.
 5. The artificial implant of Claim 3 wherein said biocompatible metal alloy is a forged CoCrMo alloy.
 6. The artificial implant of Claim 5 wherein said implant is an artificial joint implant and said at least one component comprises an articulating surface of said implant.
 7. The artificial implant of Claim 6 wherein said at least one component comprises a ball component of said implant.
 8. The artificial implant of Claim 5 wherein said implant is an artificial joint implant and said at least one component comprises a non-articulating component of an articulating implant.

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9. The artificial implant of Claim 5 wherein said implant is a fracture fixation device.

10. The artificial implant of Claim 5 wherein said at least one component is selected from the group consisting of nails, screws, and plates.

11. The artificial implant of Claim 5 wherein said biocompatible metal alloy consists essentially of about 26 to about 28 weight percent chromium, about 5 to about 6 weight percent molybdenum, up to about 1 weight percent manganese, up to about 1 percent nickel, up to about 0.75 weight per iron, up to about 0.07 percent by weight carbon, up to about 0.25 weight percent nitrogen, less than about 0.10% Si, less than about 0.02% Ti, the remainder of the alloy constituting cobalt and impurities.

12. The artificial implant of Claim 11 wherein said implant is an artificial joint implant and said at least one component comprises an articulating surface of said implant.

13. The artificial implant of Claim 12 wherein said at least one component comprises a ball component of said implant.

14. The artificial implant of Claim 11 wherein said implant is an artificial joint implant and said at least one component comprises a non-articulating component of an articulating implant.

15. The artificial implant of Claim 11 wherein said implant is a fracture fixation device.

16. The artificial implant of Claim 15 wherein said at least one component is selected from the group consisting of nails, screws, and plates.

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less than about 0.10% Si; and
less than about 0.02% Ti.

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25. The biocompatible metal alloy of Claim 23, said alloy being essentially free of any second phase particles.

26. A method of manufacturing a cobalt-base alloy implant component comprising the steps:

5 providing a bar stock of biocompatible cobalt-base alloy; and
precision machining the bar stock under conditions sufficient to remove
metal from said bar stock to form an implant component of predetermined shape without
deforming the structure of said alloy sufficiently that the mean average increase in
surface defects of a size above 5 micrometers is greater than 10 when said implant
component is subjected to accelerated chemical aging by immersing the component in
human synovial fluid inside a sealed pressure vessel and heating the pressure vessel to a
10 temperature of 159°C, plus or minus 1°C, for 8.6 days.

27. The method of Claim 26 wherein said precision machining step is conducted without deforming the structure of said alloy sufficiently that the mean average increase in surface defects of a size above 5 micrometers is greater than 7.5 when said implant component is subjected to said accelerated chemical aging.

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28. The method of Claim 26 wherein said precision machining step is conducted without deforming the structure of said alloy sufficiently that the mean average increase in surface defects of a size above 5 micrometers is greater than 3.5 when said implant component is subjected to said accelerated chemical aging.

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29. The method of Claim 26 wherein said precision machining step is conducted without deforming the structure of said alloy sufficiently that the mean average increase in surface defects of a size above 5 micrometers is greater than 2 when said implant component is subjected to said accelerated chemical aging.

